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CACTUS AND SUCCULENT JOURNAL

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Courtesy Harry Johnson

Opuntia basilaris

CACTUS AND SUCCULENT JOURNAL

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A monthly magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. "The Cactaceae," by N. L. Britton and J. N. Rose, has been adopted by this journal for purposes of identification. (Membership and subscription $3.00 per year. foreign $3.00 per year.) Mail membership application and subscription to the Secretary, Ted Hutchison, 1800 Marengo Street, Los Angeles, California.

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Courtesy Standard Oil Bulletin

Carnegiea gigantea
Biltmore Hotel Golf Course, Phoenix, Arizona

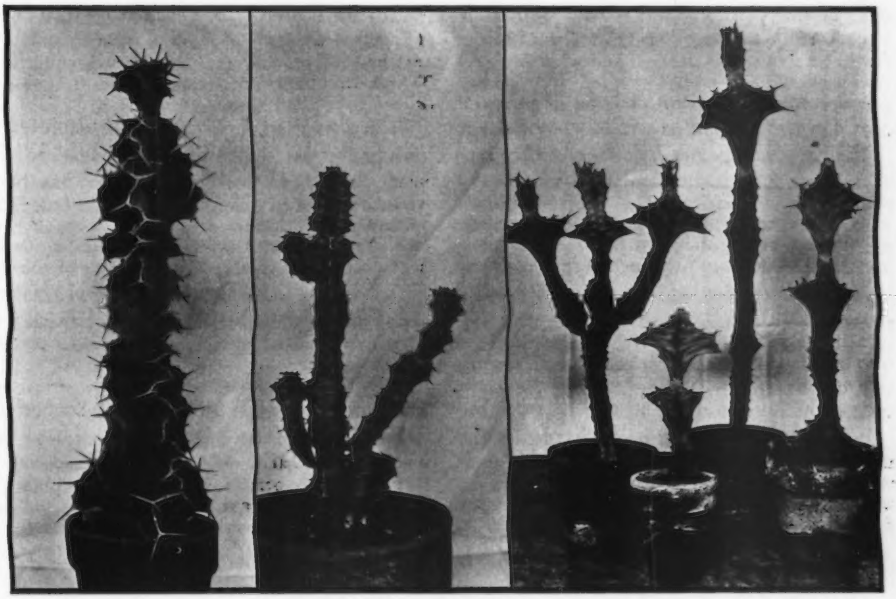


Photo by B. L. Sloane

LEFT: *Euphorbia grandicornis* Goebel x .2 RIGHT: *Euphorbia Lemaireana* Boiss x .15
CENTER: *Euphorbia pseudocactus* Berg x .3

Euphorbia Lemaireana Boiss

By G. A. FRICK

Euphorbia Lemaireana Boiss is a hybrid that bears two different kinds of growths, each like one of the parent species. This plant is a cross between *E. grandicornis* Goebel and *E. pseudocactus* Berger. Parts of the plant bears the growing habit and appearance of *E. grandicornis,* while others more like *E. pseudocactus.*

In botany this strange class of hybrid is called a chimaera, which denotes a hybrid that preserves separate identities in their parts rather than a mixture of characteristics throughout as is found in the majority of hybrids such as *E. Frankeana* which is a cross of *E. coerulescens* with *E. Ledienii* and does not show the individuality of either of the parent species.

In Greek mythology a chimaera was a fire-breathing female monster resembling a lion in the fore part, a goat in the middle, and a dragon behind; today the word is used for any grotesque, fantastic or imaginary beast employed in decorations when not referred to in botany.

The difference in the growing season of *E. grandicornis* and that of *E. pseudocactus* is permanently registered in the development of *E. Lemaireana.* Close observation of this phenomenon has shown that the grandicornis characteristics dominates this hybrid during the season when this species is in the habit of putting on new growth, while the *pseudocactus* season for growth, which is about three months later always produces characteristics of that species.

Where growth is forced, the imminent influence in *E. Lemaireana* seems to be the *grandicornis* character. This was proven in experiments with Pokon, a Dutch growth-stimulating food for plants; nothing but the *grandicornis* growth was produced by this stimulant regardless of whether it was administered in the *grandicornis* or *pseudocactus* growing season. A plant of *Lemaireana,* in the collection of Dr. A. D. Houghton at San Fernando, California, growing in ordinary soil and out of doors all year around, shows the *pseudocactus* characteristics by 95%; this is a common occurrence when grown under natural growing condition.

Over a period of four years, several attempts to cross other species of Euphorbia with that of *E. Lemaireana* in an effort to learn what a mon-

grel of that nature would act and appear like has met with failure. The seeds always turned out to be about 98% sterile; and what few seed did prove fertile always yielded true *grandicornis* seedlings, proving that the perpetuation of *E. Lemaireana* must be carried on by cuttings.

The outstanding *pseudocactus* character seen in *E. Lemaireana* is the regular yellow-green V marking on the stems. The point of this V ends in the valley of the stem with the upper opening straddling the spine base. These markings are always more prominent when the plant is grown under glass or in a room, than when grown out of doors.

Although *E. pseudocactus* is one of the most common Euphorbias, information of its nativity can not be ascertained, and suggests the question: is this species also a hybrid?

Where is there a collection of Succulents that can not boast a *grandicornis?* For oddity it is outstanding among Euphorbiae, always attractive, does well in any soil and survives under treatment that would kill most plants. It is often mistaken for *E. grandidens* which is an altogether different species but makes a splendid partner for *grandicornis* in a showy collection. There isn't much that can be said for *grandicornis,* the plant speaks for itself.

The identity of *E. Lemaireana* is doubtful. I have never seen Boissiers description of the plant, and from what information has been gathered through correspondence with European collectors and dealers, it is said that the hybrid was created at the Jardin des Plantes in Paris, but whether this union was the result of experimental hybridisation for the purpose of creating a dissimilar Euphorbia, or the self fertilization of the two parent species, we have been unable to learn.

Dr. Leon Croizat of New York who has been making a close study of the Euphorbiae nomenclature of late, states in a letter to the writer that the name *E. Lemaireana* is not valid, but until the correct name for the plant is learned, it seems only reasonable that *E. Lemaireana* should stand.

Cacti and Succulents

From the Popular Viewpoint

A talk by CHARLES GIBBS ADAMS, President of Cactus and Succulent Society of America, before the 1933 Convention of the Federation of Natural Sciences.

The subject assigned to me is altogether too big and too general to be covered in an hour. In fact, it embraces thirty different topics, any one of which would be left unfinished in an hour.

The national body's name of Cactus and Succulent Society of America is a bit misleading, (though it would have been unwieldly if longer), and my subject as printed in your programs is likewise. The only correct wording would be Cacti and *Other* Succulents; for Cacti are true succulents and the most important and interesting ones.

Cacti, the most recently born of all plant families on earth, are likewise the most varied, the most grotesque, and in some instances the most beautiful and in others the ugliest, (if any growing thing could honestly be called ugly).

So trifling are the exceptions that it can safely be said that the Cacti are all natives of the Americas. They have, however, vigorously naturalized themselves in Australia, Africa and Southern Europe, and are cultivated in gardens or under glass in every civilized land.

They come to the help of man in multitudinous ways, especially in supplying food.

In the relatively few thousands of years the Cacti have inhabited the earth, they have developed species in tremendous number, each wonderfully and ingeniously fitted for life in its own region,—usually a desert area but sometimes even a damp tropical jungle, or even a snow-laden far northern prairie. And the varieties and hybrids (the latter often man-made) are now beyond counting. But these are simply grouped into a few broad *genera,* which the successful student must master, at least in a general way.

For instances:

Most common, at least hereabout, and the most able colonizers as well, are the Opuntias. These are the common useful and fruitful "slab cacti," alias "Prickly Pears," alias "tunas," alias "nopales," generally designated as Platyopuntias; and the common "cane cacti," alias "Chollas," alias "jumping cacti," generally designated Cylindropuntias for their round stems.

Then there is the great genus of Cacti, many of them with flowers of rare beauty, valuable fruit and medicinal and timber gifts. They range all the way from the rope-like vines of the Selenicereus of the tropics, famed for its ex-

quisite, incensed, nocturnal flowers, through the funny "Old Man Cactus" or *Cephalocereus senilis,* clear up to the *Carnegiea gigantea,* or huge tree-like Sajuaro of the Arizona deserts, most noble of all the family.

The low and generally globular or pudding-mold Neomammillarias appear in myriad interesting forms.

The Pereskias, mostly vines of pretty flowers and sweet fruits, are generally distinguished from the other genera by conspicuous leaves. They are the fancier's best budding stock.

The Rhipsalis, which the amateur finds hard to accept as true Cacti, generally grow from the joints of trees, like Mistletoe.

But just a word, now, as to their many uses to man, beside their interest and beauty.

Beside the fruits, they furnish food by way of slabs, some eaten raw, some cooked. The pulp of some makes candy, the juice, jelly. Some afford dyes, some valuable fibre. Mexico has hundreds of miles of living fences of Cacti, making ranchos absolutely impenetrable to enemies whether humans or animals. The Mission Fathers of California protected their domains in the same way, and fragments of their hedges still flourish after a century and a half.

One could talk for an hour on the marvels of ingenuity with which the Cacti have fitted themselves for life in hostile places: the anti-evaporation surfaces they have developed, the ridges and grooves with which they have manufactured partial shade for their own skins, the thorns with which they parry the hungry and thirsty creatures that would exterminate them.

There are those who do not like Cacti, on the grounds that they are hostile. Such is not the case, any more than it is with our own country. They are not hostile, but merely self-protective. To those people, the other Succulents are more appealing.

The gardener of California and other gentle lands can find his best and most generous winter color among the Aloes and Mesembryanthemums. Many Aloes, or "Red Hot Pokers" or "Torch Flowers," not only blossom in the height of winter, when garden color is most difficult to find, but flaunt the gayest reds and oranges that fit the holiday seasons.

The Aloes range in size all the way from the tiny Brevifolia for path borders up through the gorgeous vine of Ciliaris, to the lordly Arborea, lifting its Christmas torches higher than the head of man.

The Mesembryanthemums not only bring bright warm reds and yellows to the winter garden, but also cool lavenders, pinks, violets and whites to every season. There need never be a day when they are not a riot of color in semi-tropic gardens. As ground cover for dry banks they surpass in hardiness and brilliancy, combined, any other material we can find. They will someday be the glory of California. Mesembryanthemum means "midday flower" in Greek.

While Africa sends us the Aloes and Mesembryanthemums, America gives the world its valuable Yuccas or "Candles of the Lord," and the Agaves or "Century Plants." While these two are often called Cacti by the ignorant, they are far from it. The Yucca is a Lily (often with suppressed desire to become a tree), and the Agave is an Amaryllis!

Our own native *Yucca Whipplei* bears the most glorious inflorescence of any plant upon this continent. Sometimes the flower stalk is ten feet tall, bearing more than a thousand perfumed lilies at a time. There is high food value in its bud stalks and its seeds. Its brother, the grotesque Joshua tree, furnishes, beside food and desert shade, fiber, fuel, tree protectors, surgical splints, etc.

The Agaves (called Century Plants because they live only ten or twelve years), furnish impenetrable hedge material to Spain, Sicily and Latin America, but food, drink and medicine as well. The Agave's name, by the way, means "admirable" in Greek.

The Euphorbias (whose name means fat, in Greek,) are a genus of at least a thousand species, mostly from Africa and tropical America. They show such amazing differences as between the flat little "Rattlesnake Weed" of our deserts, some of the "Milkweeds," the "Crown of Thorns," the festive Poinsettia, and some gaunt, apparently leafless ghost trees of Africa. The Euphorbias yield first place for Christmas color to the Aloes and Mesembryanthemums, only. I can recall no more thrilling feast than whole hillsides aflame with wild Poinsettias in Mexico.

The "Air Bells" or Cotyledons (whose Greek name means "cavity," for some have concave leaves), are almost as fine for warm winter color. So are the numerous Sempervivums or or "Air Plants," the Echervirias or "Hen and Chickens," and the Kleinias or "Sausage Plants." I know no finer group than those three, along with the Dudleyas (most of which California has given the garden world) and the Crassulas, in the way of design, in arrangement of leaf and flower. The Crassula's name means "a little thick," in Latin.

Too bad we have not time for the bizarre Kalanchoes, the Portulacarias, the Dykias, Ha-

worthias and many more; but, with a word for Sedums, we shall at least have considered the most important genera.

The Sedums are probably the world's most important rock garden plants, with species for every climate and elevation, except the most extreme. They furnish leafage in a hundred shades of green, silver, red and bronze. Several species are used extensively for ground covers, especially under trees, in southern Europe, where lawn is practically unknown. The Latin name of Sedum comes from the verb to sit, probably from the way it nestles among rocks. The hardiness, the adaptability, the accommodating ways of these succulents (at least in temperate climates), is well designated by their general name in Mexico, where they are used so much: "Siempre vivas," meaning "Live Forevers."

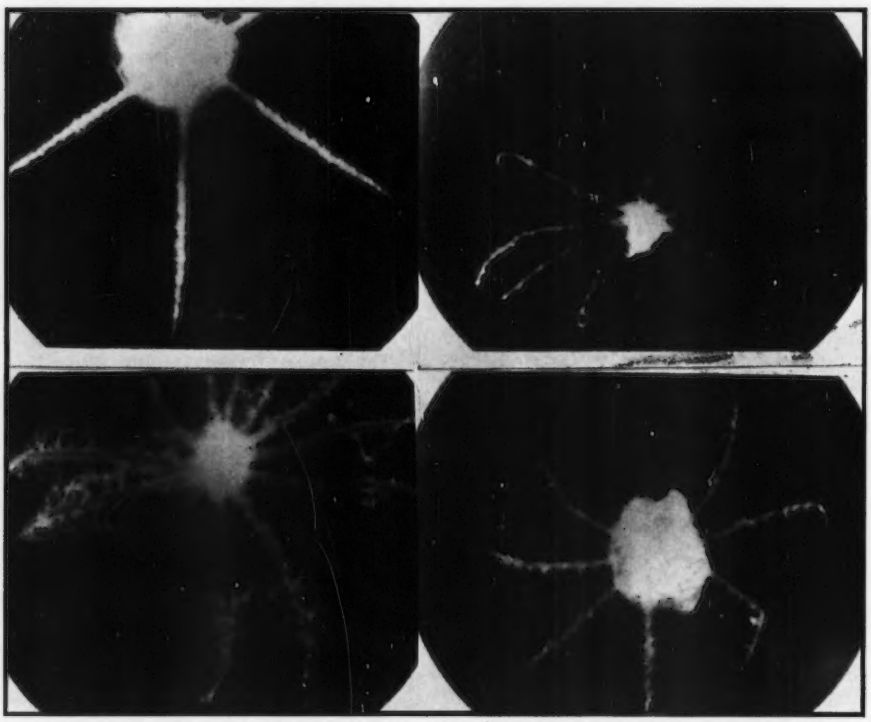


FIG. 1 (upper left): Primordial spines of *Neolloydia Beguinii* (Web.) Br. & R. Microphotograph direct on paper.
FIG. 2 (upper right): *Thelocactus hexaedrophorus* (Lem.) Br. & R.
FIG. 3 (lower left): *Neolloydia conoidea* (D. C.) Br. & R.
FIG. 4 (lower right): *Neolloydia ceratites* (Quehl) Br. & R.

Is *Echinocactus Beguinii* Web. a *Thelocactus* or a *Neolloydia?*

By PROF. DR. FRANZ BUXBAUM, Styria, Austria

There are two opinions about the genus of *Echinocactus Beguinii* Web. While Britton & Rose consider it to be a species of *Neolloydia,* some recent German authors include it in *Thelocactus.*

The differences between the two genera are in mature plants so slight that one may easily hesitate about the generic status of certain species of intermediate character.

In the key the two genera are thus charac-

terized in Britton & Rose:

Tubercles not deeply grooved; fruit scaly . . . *Thelocactus.*

Tubercles deeply grooved; fruit nearly naked . . . *Neolloydia.*

It seems to me that these distinctions are rather hard to grasp. But it is easier to come to conclusions by reading the generic descriptions:

THELOCACTUS: "Cacti of medium size, *globular or somewhat depressed,* spiny, often densely so; ribs few, low or even indefinite, divided into large, often spiraled tubercles; *flowering tubercles more or less grooved above;* flowers from near center of plant, borne on very young tubercles, rather large for the subtribe, campanulate, diurnal; scales on ovary usually few, their axils naked; fruit so far as known dry, dehiscing by a basal pore; seed black, finely tuberculated, with a large basal hilum."

NEOLLOYDIA: Small, cespitose cacti, fibrous-rooted, *cylindric,* densely spiny, tubercled; tubercles more or less arranged on spiraled ribs, grooved above; radial spines numerous, widely spreading; central spines one to several, much stouter and longer than the radials; flowers large, pink or purple, *subcentral from axils of nascent tubercles,* their segments widely spreading; fruit compressed-globose, dull-colored, thin-walled, becoming papery, dry, with a few scales or none; seeds globose, black, dull tuberculate-roughened, with a large basal scar; embryo straight in typical species."

As we see, even here we can not find definite characteristics enabling us to assign a plant to this genus or the other.

Nevertheless, I am quite sure that Britton & Rose are right. For their opinion is confirmed by my observations regarding comparative morphology of the primordial spines ("baby spines") in the first year of the seedling. The primordial spines are no doubt uninfluenced by ecologic factors, the character is exclusively formed by phylogeny.*[1]

I have been studying the primordial spines of a great many specimens of cacti from this point of view. I hope by the present essay to prove that my methods may be applied to the solution of similar problems.

*1. NOTE: While working on this essay I received No. 10 of the CACTUS JOURNAL with A. D. Houghton's essay on Recapitulation Theory. I am sure he is right. But, as my studies, made in the past two years on about 2,000 seedlings of more than 150 species show, the observations must be made with a microscope at x50 -x100 magnification, because the differences of juvenile spines are often very subtle. I should be happy if the members of the Society would aid my studies by sending correctly determined seeds, particularly of *Echinocactanae* and *Coryphanthanae* to my address: Fuerstenfeld, Styria, Austria.

The seedlings of *"Echinocactus Beguinii"* are inclined to become cylindrical (cf. in B. & R.: *Neolloydia*: stems cylindrical) while *Thelocactus* seedings are short and more or less rounded (cf. B. & R.: *Thelocactus*: stems globose-depressed).

Primordial spines of seedlings:

E. Beguinii is conspicuous by its plumose juvenile spines, resembling the spines of *Neomammillaria plumosa.* They are soft, flexible, not pungent. Near the base begin thin feathery hairs, very ragged and dense, particularly on the older ones, but very irregularly arranged. (Fig. 1), Often the spine is densely covered with hairs up to its tip, or again the hairs may become fewer near the spine-tip. The spine tip divides into several hairs in a stag-horn-like manner. The spines of 2-year-old seedlings differ only in being longer and more ragged. There is no central spine, all are radial.

The juvenile spines of a typical *Thelocactus* are very different from these. The primordial spines of all species investigated by me are acute, nearly pungent, and resemble the spines of mature plants. Generally they have only a few very short tubercle-like excrescences (*Th. lopthothele, Th. phymatothele*), while in *Th. bicolor* the later juvenile spines are more or less densely covered with tubercles, but never up to the pungent tip. In the type-species, *Th. hexaedrophorus,* the spines resemble those of *Th. bicolor,* but the tubercles are lengthened into short rectangular spreading hairs which are arranged around the spine (Fig. 2).

The type-species of *Neolloydia,* on the contrary, *N. conoidea,* has juvenile spines resembling very much those of *N. Beguinii.* As in *N. Beguinii,* the primordial spines are not acute, not pungent, soft and irregularly feathery up to the usually fimbriate tip. They are only a little shorter and less ragged than in *N. Beguinii* (Fig. 3), as are also the first- and second-year spines of *N. ceratites* (Fig. 4).

As we see, the juvenile spines provide us with the first unquestionably certain character for distinguishing between the two genera, and *Echinocactus Beguinii* is indubitably a *Neolloydia* and not a *Thelocactus.*

Moreover, it also becomes evident that the two genera are not as nearly related as it would appear from looking at mature plants.

LISTS RECEIVED

Descriptive Price List of Cacti from Howard Gates, 119 S. Illinois St., Anaheim, Cal. 12 pages with fine illustrations. Free.

Preliminary Report on the Cytology of the Mesembs

By DONALD A. JOHANSEN

An astonishingly large number of genera have been segregated from the familiar old genus *Mesembryanthemum* during recent years. The majority of these new genera contain either a single species or not more than four or five altogether. The principal character upon which most of the new genera are based is the structure of the mature fruit. This, on first impression, seems to be a simple character which anyone with a little botanical knowledge could use, but it has turned out that even expert botanists have experienced difficulty with it. There seems, moreover, to exist a probability that the structure of the fruit in some of the genera is not as constant a character as we have been led to believe. In other words, sufficient allowance has not been made for variations. Several taxonomists have already expressed the opinion that the structure of the fruit alone seemed to be an inadequate foundation upon which to erect as huge a superstructure as has been done. Consequently, it appeared desirable to ascertain whether buttresses were to be found in the number and morphology of the chromosomes. The writer has been engaged intermittently upon this study during the past three years and has obtained results which seem to be sufficiently interesting to warrant preliminary presentation.

Up to May 15 of the current year, 52 species in approximately 28 of the new genera, as well as several species still retained in the genus *Mesembryanthemum* as newly constituted, have been examined cytologically. In too many of the species, each plant produces but one flower a year, and as only a single example of many species was available, recourse had to be had to the root-tips as a source of material. Consequently, only the somatic (or diploid) chromosomes have been considered. Of the 52 species, 36 are diploid with 18 somatic chromosomes; 8 are tetraploid with 36 somatic chromosomes; while two are atypical and the identities of the remaining species are still uncertain.

One of the atypical forms is *Bergeranthus vespertinus* (Berger) Schw., which has 34 somatic chromosomes; the most obvious explanation is that a pair of chromosomes has disappeared from the normal tetraploid set. The related species *B. scapiger* (Haw.) N.E.Br. is tetraploid, but its chromosomes are smaller than those of *B. vespertinus,* although of much the same shape. *B. multiceps* (Salm Dyck) Schw., the only other species in the genus which has been examined, is diploid; all of its chromosomes are deeply constricted at the middle, but those of the other species are not.

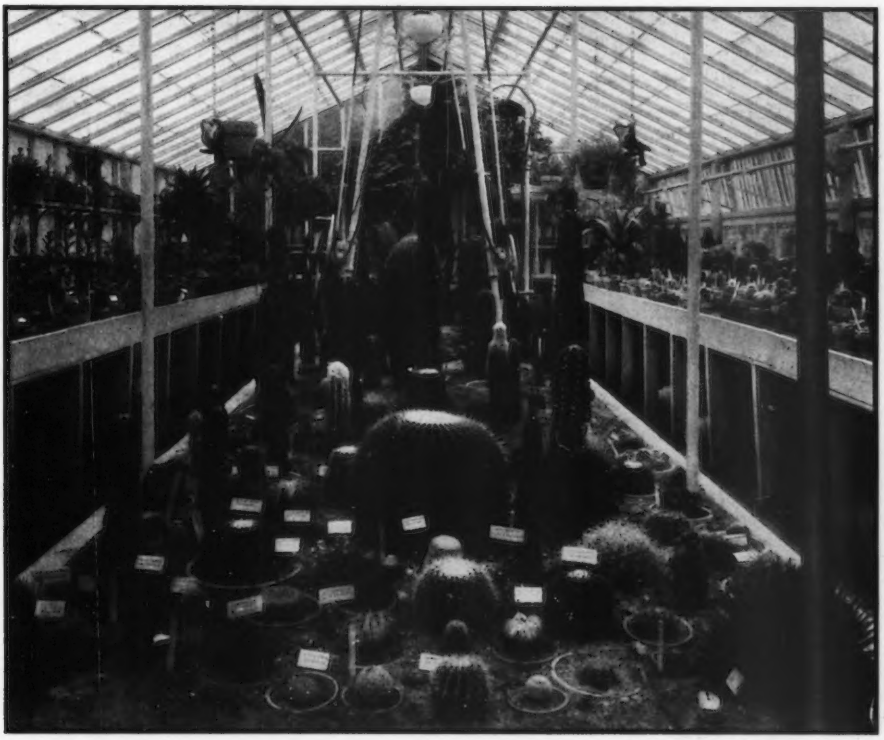
The second anomalous species is *Gibbaeum pubescens* N.E.Br. We are not absolutely certain of the count because of the large number of chromosomes, but the total number is probably 54, which makes it a sexiploid plant (that is, there are six haploid sets of chromosomes present). The only other species of *Gibbaeum* which has thus far been examined is *G. geminum N.E.Br.* This is a tetraploid species.

The study of the species of *Glottiphyllum* has been especially interesting. As many Mesemb collectors know, most of the species exist in two different forms. One form consists of plants which are small, hard and reddish-tinged; the other form is much larger, softer and of a light green color. In *G. haagei* (which name I have been unable to trace), in the small, hard form, the chromosomes are small and narrow, while in the larger form they are a trifle longer and over twice the diameter. In the first form, further, no trace of the peculiar trabants or satellites could be found, but these were conspicuous in the larger form.

The most striking aspect of the investigation is that each of the genera with but a single species is diploid. On the other hand, practically no genus in which three or more species have been studied is without a tetraploid form. There is no way, as far as I have been able to discover, of distinguishing a tetraploid from a diploid form by the appearance or characteristics of the species concerned.

In conclusion, it may be said that no adequate cytological evidence to justify the segregation of so many closely related genera from a single older genus has yet been adduced; on the contrary, all the evidence points toward the cytological homogeneity of the genus *Mesembryanthemum* as originally constituted. However, from the purely practical standpoint of horticultural identification, the writer holds no brief against the erection of the innumerable new genera.

The following 8 pages are reprinted from "The Cactaceae" by N. L. Britton and J. N. Rose.



A TEXAS COLLECTION

By G. A. FRICK

One of the outstanding collections of cacti and succulents in Texas is that of J. Frank Parks of Dallas. In the Parks garden there is a landscaped rockery of cacti forty feet square which contains scores of hardy species native to Texas, Arizona and New Mexico. This is only an introduction to the real interesting collection of rare specimens enclosed under glass and which receives the attention and devotion of both Mr. and Mrs. Parks, as shown by accompanying photo.

How Mr. Parks acquired the "Cactophobia" (as the hobby of collecting these plants in Dallas is called, was recently published in the Dallas Morning News as follows: "There was a time when Frank Parks, bereft of a daughter (their only child) lost interest in business, health and life itself. There must have existed between the two that peculiar, deep devotion sometimes seen between father and daughter. Then the heartbroken father, quite without anchorage, traveling in Mexico, exhibited casual interest in a cactus. Wise Mrs. Parks encouraged it. Today his hobby furnishes surcease; he lives and breathes cactus. Only the wife and his banker know how much this retired Dallas merchant has spent in persuit of his hobby. The latter may chafe a little at his client's non-interest in commercial pursuits, but the former knows it is worth all it costs."

In the home of Mr. Parks weekly meetings are held by the Dallas members of this society and there is talk of forming a northern Texas branch of the Cactus and Succulent Society which will embrace Fort Worth and Dallas.

FRICK NOTES

Make a mental note of the name Lois Chambers. She is a chic young Miss majoring in botany at the University of California at Berkeley. Lois is keenly Cactus-minded and is destined to be a "big shot" in cactus literature in a very few years. She is the daughter of W. Lee Chambers, a charter member of the society, and at the present time she is working over the classification of Cactus native to California.

* * *

Member H. Lightfoot Forbes of Maryland has presented the society library with two large photographs of the Hovey collection of Cactus and Succulents taken in Boston, Mass., 55 years ago. Mr. Hovey was the creator of *Echeveria hoveyii,* a hybrid.

SPECIALIZATION

Laredo, Texas.

Mr. Baxter: Your excellent article on the advisability of specialization in February 1933 Journal appeals to me strongly. In my opinion the only way that we will ever get accurate and correct knowledge of the Cactaceae will be by the combined efforts of a number of specialists each working on the plants of one particular district.

In answer to your request to hear from some one who has a number of the Echinocerei I am enclosing a list of the species of this genus that are now in my garden and would be glad to furnish you any information and co-operate with you to the extent of my ability.

Some of these species, the Lower California members particularly, are quite small and have not yet flowered but the necessary information about these can undoubtedly be obtained from H. E. Gates.

DR. W. E. LOWRY, SR.

1. *Echinocereus delaeti*
2. *Echinocereus triglochidiatus*
3. *Echinocereus polyacanthus*
4. *Echinocereus conoideus*
5. *Echinocereus rosei ?*
6. *Echinocereus chloranthus*
7. *Echinocereus viridiflorus*
8. *Echinocereus dasyacanthus*
9. *Echinocereus papillosus—two varieties*
10. *Echinocereus pentalophus*
11. *Echinocereus salm-dyckianus*
12. *Echinocereus caespitosus*
13. *Echinocereus reichenbachii*
14. *Echinocereus rigidissimus*
15. *Echinocereus blanckii*
16. *Echinocereus pectinatus*
17. *Echinocereus ctenoides*
18. *Echinocereus fitchii*
19. *Echinocereus fendlerii*
20. *Echinocereus bonkerae*
21. *Echinocereus enneacanthus*
22. *Echinocereus baileyi*
23. *Echinocereus dubius*
24. *Echinocereus davisii*
25. *Echinocereus engelmannii*
26. *Echinocereus chrysocentrus*
27. *Echinocereus sarissaphorus*
28. *Echinocereus knippelianus*
29. *Echinocereus pulchellus*
30. *Echinocereus merkerii*
31. *Echinocereus cinerascens*
32. *Echinocereus conglomeratus*
33. *Echinocereus stramineus*
34. *Echinocereus barthelowanus*
35. *Echinocereus longisetus*
36. *Echinocereus mojavensis*
37. *Echinocereus maritimus*
38. *Echinocereus perbellus—two varieties*
39. *Echinocereus brenbergii*
40. *Echinocereus poselgeriana*
41. *Echinocereus sp?—long spined (10 cm), brick-red rotate tubular flower of great duration*
42. *Echinocereus sp?—ivory white spines, fibrous, close to conglomeratus and stramineus*
43. *Echinocereus sp?—said to be white flowered, possibly albino enneacanthus*
44. *Echinocereus sp?—gigantea, short heavy spines, Phoenix, Arizona*
45. *Echinocereus sp?—thick jointed prostrate, few spines, joints up to 1 meter long*
46. *Echinocereus brandegeei*
47. *Echinocereus sciurus*
48. *Echinocereus pensilis*
49. *Echinocereus octacanthus ?*
50. *Echinocereus coccineus*

The two varieties of *Echinocereus papillosus* differ from each other in size of plant body, proportionate size and prominence of tubercles and in the proportionate length and size of central spine as compared to the radials. Flower and fruit apparently identical. Distribution of large form is, as far as I know limited to a small district 15 to 20 miles north of Laredo, small form exists from 50 miles east for 75 or 100 miles toward the coast. Nowhere very plentiful as compared with the other native Echinocerei.

The two varieties of *E. perbellus* differ markedly in size of plant and in manner of growth and somewhat in color of spines. The large variety, from near the type locality forms clusters of 8 to 10 heads about 5 cm. in diameter by 20 to 30 in height, erect and springing from a common base, the smaller variety, from near Alice, Jim Wells County is usually solitary or in clusters of 3 to 4 heads, spreading, from 2 cm. to 3 cm. diameter by 6 to 10 cm. high. It is usually of a darker color than the large variety, or rather it never assumes the light brown shade that is frequently found in the large variety. Flowers similar, fruit unknown to me.

I have not included *E. berlandieri* in the list as I am somewhat doubtful about this species. Am awaiting the opening of buds on some of the plants in order to be sure. What is ordinarily supplied from this district as *E. berlandieri* is undoubtedly *E. pentalophus*.

Among some plants that I sent Mrs. John D. Wright as *E. fitchii* were several that she classified as *E. scopulorum*. I have not included this species in my list as the points of difference were very slight and to be accounted for by individual variation and because of the extraordinary extension of the area of distribution of the last named species.

I am doubtful as to the correctness of No. 5, *E. rosei*, and as to the differences, if any, between *E. caespitosus* and *E. reichenbachii*.

E. poselgeriana, given in the "Cactaceae" as a synonym for *E. blanckii*, is a distinctly different species, resembling *E. blanckii* only in its manner of reproducing from underground roots. This species also assumes two very different forms, so distinct in appearance that only the fact that both forms are found springing from the same root connects them.

As far as I know, Nos. 41, 42, 44, and 45 are unnamed species, although the last may just be a variation of *E. enneacanthus*.

In addition I have a plant furnished by Davis of Marathon as *enneacanthus* but with red flower nearer to *triglochidiatus* and several other unidentified species and a monstrous form of *enneacanthus*.

EDITOR'S NOTE: This is a very interesting list of one genus and shows what can be done by specializing. Those interested in this genus may be glad to write Dr. Lowry. We are anxious to help anyone following a scientific plan. Dr Lowry will report again as he adds to this collection.—*S. E. H.*

STILL ANOTHER GRAPTOPETALUM

By ERIC WALTHER

G. occidentale Rose *new sp.* (*1)

Through the courtesy of Dr. N. L. Britton, of the New York Botanical Garden, and Dr. Wm. Maxon of the U. S. National Herbarium, we are enabled to publish still another species of *Graptopetalum*, i. e. *G. occidentale* Rose *new sp.* This makes a total at present of 8 species in a genus, of special interest to us, as a possibly surviving ancestral prototype from which the genus *Echeveria* may have been derived.

G. occidentale Rose new species:

Acaulescent, crowned by a dense rosette of small leaves; leaves 1 to 1.5 cm. long, oblanceolate to spathulate with an ovate acuminate tip, thin when dry, perhaps somewhat glaucous; flowering stem 1.5 dm. long, purplish, slender, 2-branched near the middle, each branch a second raceme of 5 or 6 flowers; pedicels 5 to 8 mm. long; sepals ovate, acute, 3 to 4 mm. long; corolla 7 to 8 mm long, spotted.

This delicate little plant, known locally as "flor de piedra"[2], was sent from Sinaloa, Mexico, by J. G. Ortega in 1920. Type in the U. S. National Herbarium, No. 1014184 (Ortega 3019). We do not know the living plant.

To this the present writer adds the following comparisons; from Rose's provisional key to the species we conclude that *G. occidentale* belongs to a group typified by *G. rusbyi*, with small rosettes of fleshy, but more or less flattened leaves and secund racemes. It differs from the closely allied *G. pucillum* in its spatulate leaves and broader, ovate sepals, as well as in distribution. *G. rusbyi* and *G. orpetii*, both from Arizona, differ in their obtuse sepals, while *G. bartrami's* inflorescence is an elongated panicle. It may be of interest to know that *G. rusbyi* and *G. orpetii* this past season flowered here simultaneously, and are undoubtedly distinct. Plants of typical *G. rusbyi*, obtained through the kindness of Mr. F. Berger, are noticeably more slender in peduncle, pedicels, sepals and corolla-segments, as well as having the corolla-tube clearly longer than the sepals.

*1: *Graptopetalum occidentale* Rose, *sp. nov.*
Planta acaulis; folis conferto-rosulatis, 1-1.5 mm. longis, oblanceolatis ad spathulatis, apicibus acuminatis; scapis lateralibus, 15 cm. altis, bifurcatis; racemis secundis, 5-6-floribus; pedicellis 5-8 mm. longis; sepalis ovatis, acutis, 3-4 mm. longis; corollis 7-8 mm. longis, maculatis.

*2: meaning *"Flower of the Rock's."*

The Secretary's Spinal Column

By TED HUTCHISON

The Cactus and Succulent Society of America spent a very agreeable day at Long Beach, Sunday, July 16. We visited the Gardens of Harry Johnson, Mrs. Fred Bixby and Mr. McGaughey. The trip was grand and we expect to have another of the same calibre at San Diego next month. May we see each other there.

Mr. Bradbury of Fontana, in addition to the Maternity Ward, the Nursery, the Hospital and others, has been building a new glass house dubbed the "Depression House." He used old photographic plates for this house and they cost him very, very little. While the Bradbury family was scraping the Collodion off the plate they ran across two negatives of the White Park Collection. These pictures were taken when the Park was still young and show many of the plants in their adolescent stages. May we have some for the Library, Mr. Bradbury?

The Long Beach Cactus Club met July 9 at the Cramer home in Long Beach. Plans for a Cactus exhibit at the fall show of the Floral Society were discussed. Next month they meet August 13 at Exposition Park. They would be very glad to have any of our members who wish to come. They are a fine bunch.

Now for another Cactus and Succulent story: Dr. Percy Rawles, of the Veterans Hospital at San Fernando and Member of our wide awake San Fernando Branch, has been confined to his bed for seven years due to the depredations of the T. B. germ. About a year ago he got stuck by a spine and caught a more deadly germ. Consequently we have another Cactus Nut. The new germ evidently was the stronger of the two for the past two months Dr. Rawles has been allowed up and around to tend his plants. No wonder Arizona raises so many Cactuses.

The Cactus and Succulent Society of Riverside met July 6 at the Citrus Experiment Station. Dr. Webber spoke on the Succulent Plants of the Karoo in South Africa. The Riverside bunch is a live wire bunch and certainly enjoy having Cactus friends visit them. When there don't miss the White Park Collection.

I am re-introducing this column hoping to carry news items and news of other Clubs. I have asked several of the Clubs to send me their meeting notices but have only heard from two of them. If you have an interesting news item send it in although I might not be able to include it here soon.

FRICK NOTES

A northern extension for *Bergeracactus emoryi* Englm. is the one-acre patch recently reported to the society officers on Catalina Island, California.

Opuntia glomerata

Opuntia glomerata in bloom, June 1931, in the garden of Mrs. William L. Otte, Santa Barbara.

That loving care meets as ready a response from the spiny cacti as from the delicate lily is proven by the healthful condition and free blooming of the many rare species of Zerophytes in the desert garden of Mrs. William L. Otte of Santa Barbara.

Members of the Cactus and Succulent Society have a rare treat in store on the coming pilgrimage to Santa Barbara in this delightful garden and the true and spontaneous hospitality of Mr. and Mrs. Otte will prove a revelation to some of us.

Mrs. Otte talks to her plants and it would seem that the plants understand her and respond to her care by offering rare and beautiful flowers such as are seldom seen by less enthusiastic cactophiles.

The above photo of *Opuntia glomerata* was taken in June, 1931, when the first white flower was proudly displayed by her plant. A similar bloom appeared on a plant of the same species in the garden of Ysabel Wright on June 29th of this year.

W. TAYLOR MARSHALL.

FRICK'S NOTES

You are not a full fledged Cactus-fan until you fully understand by experience what the term "retrorsely barbed" means. That is the label botanists have given to spines that enter your flesh easily but are pulled out with the utmost difficulty and causes much pain and lasting discomfort.

* * *

J. O. Pattee an old trapper who traversed Arizona in 1825 was the first Anglo-Saxon who laid eyes on the *Carnegiea gigantea.*

This is the best month to transplant backward and sickly Euphorbias that have been in pots for over one year. Also now is a good time to treat your Euphorbias with a liquid fertilizer. Here is the way to make it: half fill a burlap sack with cow manure, and suspend in a barrel of water, and when it is the color of weak tea it is ready for use. Water with a spouted can, being careful to keep the liquid off the plants themselves. Never apply this liquid fertilizer when the soil is dry, and use all of it within 3 days.

* * *

Vincent M. Petrullo, a young explorer and ethnologist of the University of Pennsylvania, is now completing an intensive study of the strangest religion *in America, the Peyote Church. To our members who do not know the common name for Lophophora Williamsii,* it is Peyote to the Indian and "jag" cactus to the white man. Mr. Petrulla claims the Peyote Church has converts in over 40 tribes of Indians and is still growing. It is a growing religion that can not be dismissed as a minor cult, and is an important force today. The service in a Peyote Church runs all *night and consists of the passing around of buttons* of the Peyote cactus plant, which in sacramental quiet are taken and chewed. The chewer fixes his mind on religious things and gains new light through the Peyote. The Peyote Church is strictly an Indian affair which perhaps accounts for its progress having gone unnoticed by the general public in America.

* * *

Something new in the way of a Cactus plant pest is reported from Nogales, Arizona. Member James Manson became so vexed at seeing his prized specimens being eaten by Termites that he called headquarters by long distance phone for advice in exterminating them. We recommended a strong solution of Foilage. Has any other member had this experience?

AUTHOR'S CORRECTION
LABELLING AND CATALOGUING A CACTUS COLLECTION

By CARL SEELBACH

In the above article which was published on page number 397 of the June JOURNAL the key number was omitted. The copy states that card No. 1 should

173
Rathbunia alamosensis (Coulter) Br. & R.

The Cactaceae Vol. II, P. 169
Standley T. & S. of Mex., P. 910

Glass House N. E.
Dr. A. D. Houghton, 4-1-32 Mexico

Arrangement of card

have a number in the upper left hand corner (173). No. 1 cards represent a chronological list of plants as received. These numbers never change although the plant name may be changed or corrected. Card No. 2 is filed alphabetically by plant name and also shows the plant number.—S. E. H.

What Grows Where

Cacti Listed in Accordance With Their Geographical Origin*

Compiled and Copyrighted for Mrs. John D. Wright, Santa Barbara, Calif., 1933

By ANNE SMITH

CALIFORNIA

OPUNTIEAE

SUBGENUS I. CYLINDROPUNTIA

OPUNTIA

Ramosissimae

O. ramosissima

TYPE LOCALITY: In California, near the Colorado Rover.
DISTRIBUTION: Southern Nevada, western Arizona, southeastern California, northwestern Sonora and probably northeastern Lower California.

Echinocarpae

O. parryi

TYPE LOCALITY: Near San Felipe, eastern slope of California Mountains, San Jacinto Mountains.
DISTRIBUTION: Interior valleys of southern California.

O. acanthocarpa

TYPE LOCALITY: In the Colorado Valley near the mouth of Bill Williams River.
DISTRIBUTION: Nevada, Utah, Arizona, California, and Lower California.

O. serpentina

TYPE LOCALITY: Near the seacoast about San Diego, California.
DISTRIBUTION: Southern California and northern Lower California.

Bigelovianae

O. bigelovii

TYPE LOCALITY: Bill Williams River, Arizona.
DISTRIBUTION: Southern Nevada, Arizona, California, northern Sonora, and northern California.

Fulgidae

O. prolifera

TYPE LOCALITY: Arid hills about San Diego, California.
DISTRIBUTION: Southern California and coast of Lower California.

Clavatae

O. parishii

TYPE LOCALITY: Mojave Desert.
DISTRIBUTION: Southern California and Nevada.

SUBGENUS 3. PLATYOPUNTIA

Basilares

O. treleasei

TYPE LOCALITY: Calienta, in the Tehachapi Mountains, California.
DISTRIBUTION: Southern California.

O. treleasii kerni (GRIFFITHS & HARE)—New Mexico Agr. Exp. Sta. Bull 60, p. 81, 1906.
TYPE LOCATION: Near Kern, California, also at Bakersfield, California.
DISTRIBUTION: Not cited.

*Unless otherwise stated the specimens mentioned have been described in The Cactaceae by Britton and Rose.

O. basilaris
TYPE LOCALITY: From Cactus Pass down the valley of the Bill Williams River.
DISTRIBUTION: Northern Sonora, western Arizona, southern California, Nevada, and southern Utah.

O. humistrata (GRIFFITHS) Griff. New spec. of Op. Bull. Torr. Club 43, p. 83, 1916.
TYPE LOCALITY: In the mountain canons above San Bernardino, California.
DISTRIBUTION: Confined to the floor of the mountain valleys of the San Bernardino region of California.

O. intricata (GRIFFITHS) Griff. New spec. of Op. Proc. Biol. Soc. Wash. 29, p. 10, 1916.
TYPE LOCALITY: Near San Bernardino, California.
DISTRIBUTION: Lower part of mountain valleys, and at the mouth of washes above San Bernardino, California.

Phaeacanthae

O. angustata
TYPE LOCALITY: Bottoms, Bill Williams Fork, Arizona.
DISTRIBUTION: Recorded as extending from New Mexico to California, but known definitely to us only from central Arizona, perhaps from central Arizona, perhaps extending north to Utah.

O. mojavensis
TYPE LOCALITY: On the Mojave, west of the Colorado, California.
DISTRIBUTION: Known only from the type locality.

O. covillei
TYPE LOCALITY: San Bernardino, California. DISTRIBUTION: Interior valleys of southern California.

O. megacarpa (GRIFFITHS) Ill. Stud. in the genus Op. II Missouri Bot. Gardens 20, p. 91, 1909.
TYPE LOCALITY: Near Banning, California.
DISTRIBUTION: Not cited.

O. vaseyi
TYPE LOCALITY: Cited as Yuma, Arizona, presumably erroneously.
DISTRIBUTION: San Bernardino and Orange Counties, southern California.

O. magenta (GRIFFITHS) Ill. Stud. of the Genus Op. I. Missouri Bot. Garden, p. 268, 1908.
TYPE LOCALITY: Collected near Redlands, California.
DISTRIBUTION: Not cited.

O. occidentalis
TYPE LOCALITY: Western slopes of the California Mountains, between San Diego and Los Angeles.
DISTRIBUTION: Southwestern California and northern Lower California and adjacent islands.

O. demissa (GRIFFITHS) Ill. Stud. in the Genus Op. IV, Missouri Bot. Gardens, 22, p. 29, 1912.
TYPE LOCALITY: East of San Diego, California.
DISTRIBUTION: Along coast south from Santa Barbara, California.

O. semispinosa (GRIFFITHS) Griff. New spec. of Op. Bull. Torr. Club, 43, p. 89, 1916.
TYPE LOCALITY: San Pedro, California.
DISTRIBUTION: Between Santa Barbara, California and Tiajuana, Mexico.

Dillenianae

O. chlorotica
TYPE LOCALITY: On both sides of the Colorado from San Francisco Mountains to headwaters of Bill Williams River.
DISTRIBUTION: Sonora and New Mexico to Nevada, California, and Lower California.

O. curvospina (GRIFFITHS) Bull. Torr. Club 43 p. 88, 1916.
TYPE LOCALITY: Between Nipton, California and Searchlight, Nevada.
DISTRIBUTION: Widely distributed in California, Nevada, Arizona desert.

O. littoralis
TYPE LOCALITY: Coast from Santa Barbara to San Diego, California.
DISTRIBUTION: Along and near the coast of southern California.

Polyacanthae

O. erinacea
TYPE LOCALITY: On Mojave Creek, California.
DISTRIBUTION: Northwestern Arizona, southern Utah, southern Nevada, and eastern California.

Can You Recognize These?

Seedlings from collection of Herman Tobusch, Chicago, Ill.

Euphorbias cereiformis L., *meloformis* Ait., *obesa* Hook, *splendens* Bojer, *monteiroi* Hook, *clava* Jacq., *muirii* N. E. Br., *stolonifera, stellaespina* Haw., *bupleurifolia* Jacq., *truncata* N. E. Br., *canariensis* L., *tuberculata* Jacq.

SOIL

By CARL SEELBACH

I am on level soil and it is hard, non-porous adobe at that. This necessitates my raising all cactus beds. Cereus and the other large, deep-rooted plants will take a much heavier soil than will the small growing and the typically desert plants.

I make a bed of two soil mixtures. First I place about six inches of adobe and slightly crown it like a paved street. This has a tendency to turn off the water that runs down through the bed and will not let water stand around the roots of the plants.

On this I place from eight to twelve inches of the following mixture: 1 part sand, 1 part decomposed granite, 2 parts good top soil, 1 part leaf mold and compost. Add to this 15% by volume of old lime and gypsum mortar.

Mix thoroughly and screen through a 1-inch mesh screen. Over this place four to six inches of a soil mixture, the same except make three parts sand instead of one part sand. If you use oak leaf mold be sure you get well rotted material and increase the lime content by 5%.

I place all large plants and make a ring of rocks around the plant and bank up the top soil mixture around the rock ring. In this I do most of my watering for capillary attraction will in most cases give enough water to the other plants. In February and again in August I use about one-half gallon of liquid fertilizer to each large plant. Place fertilizer around the plant and then water well.

FRICK NOTES

A member whose name is withheld from publication, writes that he blames us for a splitting headache he had the morning after giving Pulque the national drink of Mexico an inquisitive trial. He holds my note in the January issue of the Journal on Pulque as a product of the Agave responsible. He claims it was the first time in his whole life that he really felt like picking a fight with somebody, yes anybody.

THE CACTUS AND SUCCULENT SOCIETY OF AMERICA

An International Society for all lovers of Xerophytes
Headquarters: 1800 MARENGO ST., LOS ANGELES, CALIFORNIA

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BOUND VOLUMES of the Cactus Journal, Vol. I, II, and III, are now on sale; these will be very valuable before many years, so take advantage of the opportunity at this time. Volume I $9.00, Volumes II, III and IV at $6 each. CACTUS AND SUCCULENT SOCIETY, 1800 Marengo St., Los Angeles, Calif.

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FRICK NOTES

A call at this would be in order for all dealers in Cactus and Succulents to get together on a fair price schedule for their plants as per President Roosevelt's proclamation. Like all other businesses, dealers in xerophytes have been having a hard time making a living. Plants have been selling at shameful prices. One nurseryman is selling one-year-old seedling *Cephalocereus Trollii* and *C. senilis* at 10c each for one and a half to two-inch plants. They cannot be raised for that, but the dealer complains that they "must eat". Three railroad cars of Texas cacti were sold to a five-and-ten-cent chain store at two cents each, which in turn retailed at 10 and 15 cents each. That is what is demoralizing the cactus dealers' business, and that is what should be overcome. This is not a call for a meeting of dealers, but an urge that you do get together among yourselves for your own good and the good of the industry. You have the government back of you in this move, and there should be some one among you who will call a meeting to discuss your situation.

The right attitude was shown by one of our most prominent dealers when he locked his place of business and hung out a sign stating that the place was closed and no plants were for sale until people wishing them were ready to pay a fair price.